Governor's STEM Advisory Council
Regional STEM Network Hub
Application

April 5, 2012

North Central Region

North Iowa Area Community College

Name of proposed requesting entity (or entries as partners):
North Iowa Area Community College

Name and title of primary contact:
Lyn Brodersen, Ph.D., Vice President, Academic and Student Affairs

Primary contact address:
500 College Drive

Primary contact city/state/zip:
Mason City, IA 50401

Primary contact office telephone:
641-422-4277

Primary contact email address:
brodelyn@niacc.edu

Region:
North Central

Proposed Location:
The proposed location of the Regional STEM Network Hub is North Iowa Area Community College's Main Campus, located in Mason City, Iowa. The College, which began as Mason City Junior College (MCJC) in 1918, has the distinction of being the very first public two-year college in Iowa and one of the first such institutions in the country.

In 1965, Iowa's 61st General Assembly enacted legislation creating a statewide system of two-year postsecondary educational institutions, identified as Merged Area Schools. The following year, with a strong foundation built on nearly 50 years of existence as Mason City Junior College, North Iowa Area Community College (Merged Area II) opened its doors in the old Mason City High School building in downtown Mason City. Enrollment exceeded 1700 full-time students.
Today, the 500-acre countryside campus consists of contemporary, state-of-the-art facilities including the Student Activity Center, Recreation Center, Muse-Norris Conference Center, and Murphy Manufacturing Technology Center, as well as lakeside student apartments.

The College also operates Community Education Centers in Charles City, Garner, Hampton, Lake Mills and Osage.

With a staff of approximately 300, the College currently offers nearly 40 one- and two-year career programs, the first two years toward a bachelor's degree in most fields, and an array of continuing education opportunities for professional and personal growth.

On average, the College serves over 3,700 degree students each year and thousands more through non-credit programs.

The office for the STEM Network Hub would be located in one of the College's centrally-located

academic buildings, and would provide part-time administrative assistant support, phone, and computer capabilities.

Identify Your Mission:

Mission
The mission of North Iowa Area Community College is to enhance the quality of life for the people of North Iowa through comprehensive educational opportunities, progressive partnerships, exemplary service, and responsive leadership.

Core Values
• Academic Excellence
• Integrity
• Community

Strategic Priorities
- Keeping NIACC First in Education
Student Quality Experience
NIACC students will have a superior learning experience as evidenced by the College collaborating to increase organizational efficiencies, delivering top-quality service, practicing learning college principles, optimizing financial aid opportunities, and increasing academic quality and student completion and success.

Quality and Relevant Education
NIACC embraces assessment as a critical and essential strategy for the continuous improvement of its programs, courses, and 21st century student learning outcomes.
Educational Center for Excellence
NIACC's Center for Excellence in Teaching and Learning serves as a resource for all employees teaching NIACC courses, in all venues across our district by providing educational support services and supporting innovative pedagogy and assessment methodology.

Expand Outreach Centers
NIACC has a strong and enhanced presence in its regional centers as evidenced by the innovative utilization of technology, expanded educational and cultural offerings, and strong public school partnerships.
Performance Metrics
NIACC has useful and meaningful key performance indicators that measure and communicate the effectiveness of teaching and learning strategies, student engagement, and administrative processes that support the educational process.
- Keeping NIACC First in Leadership
Innovative Educational Methods
NIACC's innovation is recognized through the research, development and application of innovative educational methods of instruction, course and program development, workforce preparation, small business development and entrepreneurship, and community engagement.

Premier Employer/Culture
NIACC is an exemplary workplace that serves as a model for other institutions across Iowa and the nation.

Collaboration with Community and Regional Organizations
NIACC promotes economic growth in North Iowa as evidenced through its facilitation of economic and workforce development strategies, which engage and collaborate with the region's economic development corporations, business and industry partners, regional and state organizations, and national initiatives.

Advocacy
NIACC advocates for education, economic vitality and the social welfare of the residents of North Iowa by engaging actively in the legislative process, economic and business development, and community service and cultural efforts.
- Keeping NIACC First in Partnership
New Types of Partnerships
NIACC's new partnerships reflect best practices, leveraging technology, facilities, and emerging innovative educational and economic strategies.
New Educational Partnerships
NIACC's new educational partnerships take advantage of new teaching and learning strategies, partnerships with other educational institutions, community-based organizations, governmental agencies, and corporate partners in support of student learning.
New Regional (Community Development) Partnerships to Promote Growth
NIACC's expanded regional partnerships provide benefit to North Iowa communities evidenced by economic growth and opportunities traced backed to NIACC's direct involvement.

Partner Viability
Each NIACC partnership provides relevant and effective use of partner resources resulting in mutual benefit to partners, the community and students.
Our strategic plan for the next five years will help us keep NIACC First in Education, Leadership, and Partnership. The plan addresses each of the strategic priorities separately to identify specific areas that have been determined to be of the greatest importance to all of our stakeholders. By design, this plan does not outline all of the strategies and activities that the College will be engaged in to reach our goals. The AQIP Quality Council will develop these strategies and activities together with the College administration, partners, and others. These activities will be documented through our Higher Learning Commission AQIP Systems Portfolios and will show NIACC's continuous progress towards the fulfillment of College strategic goals.

There is no question that being the host of a Regional STEM Network Hub would allow NIACC to further its mission and strategic plan for premier education, leadership, and partnership in the North Iowa Area.

Identify Support:
NIACC will provide part-time support staff, office furniture, computers, network/email access, and motor vehicle access for the assigned Regional STEM Network Hub Advocate.

Participating Organizations:
- Area Education Agency
- Nonprofit/informal learning centers
- Regional economic development and local chambers throughout the NIACC service area
- Iowa State Extension and Outreach
- K-12 student/parent
- Team Quest, Kingland, Golden Grain, Valent Technologies, Sukup

- Buena Vista University, Wartburg College, Waldorf College
- Iowa State University, University of Iowa, and the University of Northern Iowa
- Rep. Josh Byrnes and Sen. Sharon Steckman
- Mason City Public Library
- STEM teacher
- Michele Appelgate, Mason City School Board
- Angie Konig, Iowa Works

NIACC would take an active role in creating, hosting, and staffing such an Advisory Council. We have active and productive relationships with the persons and organizations named specifically within this list. College Advisory Committee guidelines provide a framework for such an organization. An Advisory Committee Charter would be developed as well, to outline goals, strategies, and outcomes for the Regional STEM Network HUB at NIACC.

Following are letters of support from A to Z Drying, Inc., Mason City-Clear Lake Public Schools, and Kingland Corp:

Dear Dr. Lyn Brodersen:

A to Z Drying, Inc. supports having NIACC be one of the centers/hubs for STEM in the state of Iowa.

Best Regards,

Jason

Jason Penfold
President
A to Z Drying, Inc.

April 4, 2012

RE: North Iowa Area Community College (NIACC) Regional STEM Hub Site

To Whom It May Concern:

As a member of the Governor's STEM Advisory Policy Matters Committee and as the current Superintendent of Schools for the Mason City and Clear Lake Community School Districts I strongly support NIACC in the opportunity to become a Regional Hub site for the STEM initiative recently signed by Governor Branstad. Our students deserve the very best opportunities in every area of our state.

There is already a very strong presence in our region that would support and sustain a regional hub of this type. We have a natural connection to STEM in our area of the state because we have two global leaders in technology and innovation, KINGLAND Systems and TeamQuest already located in North Iowa. We want to keep them thriving and attracting new talent and families to our area and state as well.

KINGLAND Systems has been working with the Technology Association of Iowa and as a partner with

Clear Lake Middle School in providing our 8th grade students to not only become aware of career pathways associated with technology but also to understand that those possibilities exist right here in our North Iowa region. The Hyperstream program has been a powerful educational tool for our students in Clear Lake.

The International Headquarters for TeamQuest is located right off I-35 in Clear Lake, Iowa. Both of these companies have ongoing job postings and a high need for engineers to work in these technology/software/high level security jobs. A regional hub site located would benefit the region in several ways; 1) to attract young people to be able to train in these fields and have real-world opportunities for internships while in high school or at the community college; 2) to return to Iowa and to this region of the state to work for one of these two companies and 3) to better connect the students in North Iowa to the possibilities and opportunities to pursue a STEM career path.

Mason City Community School District has a long history of providing STEM coursework for high school students in our community and region. Currently we provide a STEM Education Roadmap for our students at the high school level. We are using the Basic Definition of Science, Technology, Engineering and Mathematics found in the Iowa STEM Education Roadmap, 2011 in describing this pathway for our students at the high school level. (see attached). Mason City has also implemented Project Lead the Way that begins with Gateway to Technology at the 8th grade level. Courses offered at the high school include Introduction to Engineering Design, Principles of Engineering, Digital Electronics and Biotechnical Engineering.

As part of our ongoing partnerships with the business community we have been able to implement an ACE Mentor program that is connected to our CTE programming at the high school. These students work with mentors from the community who work in the fields of engineering, architecture and construction to design a “real-world” project and present this to an audience of community members each year. This has been a powerful partnership and connection for our students who want experiences beyond the classroom in these fields of interest.

We strongly recommend that you choose NIACC FIRST for a Regional STEM Hub site! Thank you for your work in creating powerful learning opportunities across this state.

Anita Micich, Superintendent of Schools for Clear Lake and Mason City Communities
Careers in this pathway are related to engineering, science, technology, construction, manufacturing, and transportation. Some occupations include airline pilots, archeologists, architects, assemblers, carpenters, drafters, engineers of all types, machinists, mechanics, scientists, tool and die makers, and truck drivers.

Professional Careers Skilled Careers Entry-Level Careers
Applied Math & Physics Air Conditioning & Heating Carpet Installer
Architect Auto Body Repair/Paint Technician Bread & Pastry Baker
Applied Technology Appliance Service Drywall Installer
Computer Science Architectural Drafting Excavating Operator
Education Bricklaying/Masonry Grader & Dozer Operator
Engineering Cabinetmaking/Millwork Hoist & Winch Operator
Genetics Carpentry Mechanic & Repair Helper
Geology Electronic Design Technician Painter & Pipe fitter Helper

Paper Science Engine Technology Roofer
Scientist Industrial Engineering Technician

FAMILY CONSUMER AND HUMAN SERVICES PATHWAY

Careers in this pathway are linked to family/consumer, economic, political and social systems. Some occupations in this career area include those in hospitality and recreation, public and community service, and the broad field of social services. Careers such as those in child care, cosmetology, economics, education, fire protection, food service, government, history, law, hotel and restaurant services, law enforcement, the military, and recreation may be found in this career pathway.

Professional Careers Skilled Careers Entry-Level Careers
Social & Behavioral Science Barber/Cosmetologist Cashier
Communications Disorders Chef Counter & Rental Clerk
Criminal Justice Child Care Services Custodian & Cleaner
Education Clothing Design & Sales Cafeteria Attendant
Hospitality/Tourism Management Corrections Services Food Service/Lodging
Law Facility Maintenance Service General Office Clerk
Nutritional Science Food Technician Postal Service Clerk
Psychology Interior Design Private Child Care Worker
Public Administration Paramedic Refuse Collector
Police Science Welfare Eligibility Worker

HEALTH SERVICES PATHWAY

Careers in this pathway are part of the health services field. They include occupations in hospital services, medical technology, medicine, nursing, optometry, pharmacy, psychiatry, psychology, therapy, and others.

Professional Careers Skilled Careers Entry-Level Careers
Art/Music Therapy Dental Hygienist Dental Assistant
Clinical Laboratory Dispensing Optician Dental Lab Technician
Education Emergency Medical Services Dietary Aide
Health Care Administration Health Unit Coordinator Home Health Aide
Medical Science Human Services Associate Interviewing Clerk
Medicine Medical Laboratory Technician Orderly and/or Attendant
Microbiology Pharmacy Technician
harmacy Practical Nurse
Physical therapy
Veterinarian

STEM Education in Mason City High School (Roadmap)

Basic Definition of Science, Technology, Engineering and Mathematics (STEM), excerpted from Iowa STEM Education Roadmap, 2011

Science can be characterized as the knowledge of the physical world gained through systematic observation and experimentation. A process by which this knowledge is developed is referred to as the scientific method, though in reality, scientists use different methods for different challenges. Typically, developing a testable or falsifiable hypothesis is a crucial first step in the traditional scientific method. Properly designed experiments test hypotheses and credibility is determined by how well a hypothesis is supported by physical data. Scientific methods, through many mechanisms for identifying mistakes, have the ability to discard inaccurate hypotheses and retain those that have withstood significant testing.

Technology is the application of scientific knowledge to the development of tools, machines, materials, or processes that change or manipulate the human environment to accomplish practical tasks or objectives. Technology is intimately related to science and to engineering. Whereas science deals with understanding and engineering uses that knowledge to create plans and designs, technology creates the tools and techniques to implement those plans and designs.

Engineering is the application of scientific principles to the design of a device, system, or process to accomplish a defined task. Engineers use approximate solutions to problems that cannot be solved exactly by science and mathematics as well as semi-empirical methods to achieve desired objectives. Although scientific and engineering processes may be different, scientists must use engineering to design and implement experiments while engineers often need to use the scientific method to test devices, processes, or systems. The two disciplines are inseparable.

Mathematics is the language by which one communicates science and engineering concepts, and is a discipline in its own right which has trained the world's greatest thinkers through history. Mathematically formulating problems lets scientists and engineers develop models of real and hypothetical phenomena, develop hypotheses, make predictions, conjectures, design devices and protocols, and express and evaluate data. Advances in an area of science have often led to advances in an area of mathematics and vice versa.

STEM Literacy refers to an individual's ability to apply his or her understanding of how the world works within and across the four areas of science, technology, engineering, and mathematics. It does not simply mean achieving literacy in these areas individually. Rather, STEM literacy refers to the ability to investigate and question these facets of the world in an interdisciplinary manner.

PROJECT LEAD THE WAY (PLTW)

The Project Lead the Way program is a STEM approved program that centers on developing better problem solving skills by immersing students in real world engineering problems. Each of the courses uses project-based, hands-on experiences to teach students the key elements and skills of engineering and technology based careers. College credit is available for students who successfully complete these courses and students interested in pursuing post-secondary programs are strongly encouraged to enroll.

PLTW Course Offerings:

264691 INTRODUCTION TO ENGINEERING DESIGN TWO CREDIT COURSE

This course is open to all students as a computer modeling software course that will allow students to learn the process of product design. During the course students will solve design problems as they

develop, create and analyze product models. Students may earn college credit upon successful completion of end of course test.

264751 PRINCIPLES OF ENGINEERING TWO CREDIT COURSE
This course is open to all students as a technology course in which students will explore technology systems and manufacturing processes to find out how math, science and technology help people. Students may earn college credit upon successful completion of end of course test.

264761 DIGITAL ELECTRONICS TWO CREDIT COURSE
ONE CREDIT PER SEMESTER
This course introduces students to applied digital logic, a key element of careers in engineering and engineering technology. This course explores the smart circuits found in watches, calculators, video games, and computers. Students use industry-standards computer software in testing and analyzing digital circuitry. They design circuits to solve problems, export their designs to a printed circuit auto-routing program that generates printed circuit boards, and use appropriate components to build their designs. Students use mathematics and science in solving real-world engineering problems. Students may earn college credit upon successful completion of end of course

264771 BIOTECHNICAL ENGINEERING TWO CREDIT COURSE
ONE CREDIT PER SEMESTER
In this Project Lead the Way (PLTW) course students explore the diverse fields of biotechnology. Hands-on projects engage students in engineering design problems related to biomechanics, cardiovascular engineering, genetic engineering, tissue engineering, biomedical devices, forensics and bioethics. Students, usually at the 11th and 12th grade level, apply biological and engineering concepts to design materials and processes that directly measure, repair, improve and extend living systems. 19

Math Courses that support a STEM education

162131 ALGEBRA 1 ONE CREDIT PER SEMESTER
TWO SEMESTER COURSE
PREREQUISITE: INTRO TO ALGEBRA
PRE-ALGEBRA OR DEPT APPROVAL
Algebra 1 includes the study of statistics and data analysis, variable expressions, functions and relationships, solving variable equations, graphing techniques, solving systems of equations and inequalities, applications of lines and distance formulas, polynomial operations, and quadratic functions and equations.

162151 GEOMETRY ONE CREDIT PER SEMESTER
TWO SEMESTER COURSE
PREREQUISITE: ALGEBRA 1
This course emphasizes inductive and deductive reasoning and the laws of logic. Topics studied are: symmetry, modeling techniques, the structure of geometry, basic definitions, postulates, theorems, proof, angles and parallel lines, triangles, quadrilaterals, other polygons, polyhedrons, the distance formula, the Pythagorean Theorem, similarity and congruence, circles and spheres, area, surface area, volume, transformations, geometric inequalities, and simple trigonometry. The probability of success is greatly increased if the student has maintained a C or above in the previous course.

162141 ALGEBRA 2 ONE CREDIT PER SEMESTER

TWO SEMESTER COURSE
PREREQUISITE: GEOMETRY
Algebra 2 reviews and builds upon the concepts of Algebra 1 and Geometry. Topics of study are: advanced polynomial manipulations, rational expressions and equations, absolute value functions, polynomial functions and inequalities, matrix algebra, quadratic functions and their applications, exponential and logarithmic functions, permutations and combinations, sequences and series, and trigonometry. Use of a graphing calculator is required throughout this text. The probability of success is greatly increased if the student has maintained a C or above in the previous course.

162411 PRE-CALCULUS ONE CREDIT PER SEMESTER
TWO SEMESTER COURSE
PREREQUISITE: ALGEBRA 2
Pre-Calculus continues the study of algebra while integrating the concepts of geometry. Topics of study are: graphing and solving functions, polynomial functions, rational functions, exponential and logarithmic functions, trigonometry functions, analytic trigonometry, applications of trigonometry, parametric and polar equations, matrix systems, and sequences and series. Concepts are studied numerically, graphically, and analytically. The graphing calculator is used extensively in this course. There is also an emphasis on problems that use the concepts in real life. The probability of success is greatly increased if the student has maintained a C or above in the previous course.

162431 AP CALCULUS ONE CREDIT PER SEMESTER
TWO SEMESTER COURSE
PREREQUISITE: PRE-CALCULUS
Calculus makes extensive use of the trigonometry and advanced algebra skills taught in Pre-Calculus. These skills are reinforced and used to study differential calculus as well as integral calculus. Extensive use of computer programs and the graphing calculator help the students visualize and practice these calculus concepts. A college level Calculus and Analytic Geometry book is used. Problem solving strategies and critical thinking skills are stressed throughout the course. The probability of success is greatly increased if the student has maintained a C or above in the previous course.
Students taking the Advanced Placement Calculus test in May will have AP Calculus recorded on their transcript if they score a 3 or better and may earn college credit for the course. By the end of this course, students will have studied all of Calculus I, much of Calculus II, and parts of Calculus III. 20

Science Courses supporting a STEM education

182521 BIOLOGY ONE CREDIT PER SEMESTER
TWO CREDIT COURSE
Biology is a challenging course designed for all students. Investigations are focused toward the ecological basis of life, biodiversity, cell structure and function, genetics, variation and adaptation, and human biology. This course is open to incoming 9th graders who are looking for a strenuous course as a freshman. Preference will be given to those that are in Algebra or higher as an 8th grader because the course is designed for 10th – 12th graders and will ensure success with pre-requisites in future college bound science classes.

182621 PHYSICS ONE CREDIT PER SEMESTER
TWO CREDIT COURSE
PREREQUISITE: GEOMETRY
This course is intended for college bound students with career interests in any of the sciences,

mathematics, computers or engineering. Physics attempts to prepare them for the rigorous courses they will face in college. Laboratory experiments constitute a major portion of the course. Topics include force, motion, energy, heat, waves, light, and electricity.

182721 CHEMISTRY ONE CREDIT PER SEMESTER
TWO CREDIT COURSE
PREREQUISITE: GEOMETRY
The study of chemistry explores matter through the classroom and the laboratory. Problem solving is a major focus. The following are areas of concentration: the atom, the Periodic Table, ionic and molecular bonding, writing chemical equations, stoichiometry organic chemistry, water and its solutions, and nuclear matters.
Because of the demands of this course, students electing to take Chemistry should be motivated to do homework and to listen carefully in class. It is recommended that Physics be taken before Chemistry.

182561 AP BIOLOGY ONE CREDIT PER SEMESTER
TWO CREDIT COURSE
PREREQUISITE: BIOLOGY (A or B grade)
Advanced Biology is designed to be the equivalent of a college introductory Biology course for Biology majors. It differs significantly from Biology in the textbook, the range and depth of topics, and the effort and time required by students. The goal of Advanced Biology is to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. The course focuses on understanding important relationships, processes, mechanisms, and potential extensions and applications with an understanding of specialized terminology and technical details. It is recommended that students have earned an A or B in the prerequisite courses of Biology and all other science classes. This is a very rigorous and intense course.
* Students taking the Advanced Placement exam will have the AP designation added to their transcript if they score a 3 or better.

182641 AP PHYSICS ONE CREDIT PER SEMESTER
TWO CREDIT COURSE
PREREQUISITE: ALGEBRA 2 AND PHYSICS
Advanced Physics is designed for those students whose career plans will require them to study Physics in college. The topics covered are similar to the topics in Physics, but are done at a greater depth. The laboratory work and the mathematical relationships are particularly more challenging. This course prepares students to take the Advanced Placement Physics Exam B in May. It is recommended that students have earned an A or B in the prerequisite courses of Physics and Algebra II.
* Students taking the Advanced Placement exam will have the AP designation added to their transcript if they score a 3 or better. 21

182761 AP CHEMISTRY ONE CREDIT PER SEMESTER
2 CREDIT COURSE
PREREQUISITE: CHEMISTRY
Advanced Chemistry is designed to be the equivalent of an introductory college chemistry course for science majors. Both the textbook assignments and laboratory requirements are similar to college work. Students electing to take this course should be willing to spend at least five hours weekly on out-of-class assignments. Advanced Chemistry expands on concepts begun in high school chemistry and will move at a college pace, considerably faster than that of the high school level course. The material is rigorous and students need to be committed, organized, and able to maintain the pace. It is recommended that

students have earned an A or B in the prerequisite course of Chemistry.
* Students taking the Advanced Placement exam will have the AP designation added to their transcript if they score a 3 or better.

Other Courses Supporting a STEM education
264983 ACE MENTORING ONE CREDIT COURSE
During a 16 week session held over roughly 20 weeks, local business persons representing the Architectural, Construction, and Engineering disciplines will expose students to diverse career opportunities in construction related fields by taking a model project from conception through design. The course will include field trips to local architecture, construction, and engineering offices, as well as some local construction sites, to see firsthand, the processes involved in breathing life into a project. This class is recommended for sophomores, juniors, and seniors interested in the architectural, construction, and engineering fields. Also, this class will meet in the evenings on Wednesdays from 3:30 – 5:00 PM in the high school IC. Students will need to provide their own transportation when the class is meeting off campus. The course starting date will be determined by the ACE Steering Committee and will start in the first semester and finish sometime in the second semester. Students enrolling in this class will be notified of the calendar by their counselor during the first month of school. Up to one full credit may be earned for completing this class. Post secondary scholarships may be available to students who complete the class.

264623 MECHANICAL DRAWING I ONE CREDIT COURSE
Students will learn the basic drafting procedures and apply to drafting equipment. They will also understand and create drawings using various drafting drawing styles. Students will understand and use spatial relationships and visualization techniques to create 2D and 3D drawings and sketches. Finally, they will learn and use employability skill of organization and techniques necessary to complete drafting projects.

264653 COMPUTER AIDED DRAFTING ONE CREDIT COURSE
PREREQUISITE: MECHANICAL DRAWING
Students will demonstrate basic CAD operations on the computer. They will also create 2D and 3D drawing using the CAD techniques and create 2D and 3D models using the CAD technology. Finally, they will utilize employability skills of using technology for information processing and productivity.

Funding Assistance:
"The NIACC Foundation has had a long successful history in supporting the key initiatives of NIACC and therefore would be ready to help NIACC with fundraising as necessary to provide matching funds or other direct support. Also, our grant writing department would be engaged in leveraging the state funds, also with other corporate grants. We have been reviewing numerous opportunities and with the state's endorsement through sitting one of the STEM network hubs in North Iowa at NIACC, it would create greater opportunities for seeking matching grants and local support. The NIACC Foundation is poised to support this effort for sustainability at the direction of the NIACC Board." Jamie Zanios, NIACC Foundation

In addition to the NIACC Foundation, NIACC is currently working with Sungard Higher Education in upgrading the technological capabilities. Through their work NIACC is emerging as a cutting-edge technological institution. Not only are NIACC's technological capabilities being upgraded, Sungard Higher Education offers the College assistance in developing grant proposals in concert with our on-campus grant writer.

Additional Information:
NIACC has a reputation of being a leader as evidenced by its inception through today's progressive partnerships. NIACC's strong Career Link program includes 8 Academies and 16 programs throughout Area II serving hundreds of high school students each year, many of these programs revolving around technology.

Science, technology and math concepts provide a fundamental framework in the educational preparation of students entering all health care professions. Didactic content integrates scientific principles that directly contribute to clinical decision making required in today's health care systems .

Internships are also an integral part of many of our academic disciplines. These opportunities for students to engage with business and industry are a vital component of the academic curriculum as well as an opportunity to connect and network with local businesses. Together NIACC and our local businesses are growing our future leaders and generating economic development opportunities for our rural communities.

National focus on the use of the Electronic Medical records (EMR) is a direct reflection of the impact technology continues to demonstrate in today's health care systems. This interprofessional communication tool focuses on documentation related to patient conditions and health care screenings that are direct results of technology and application of skills required to manage these activities. Technological integration in acute, out-patient, clinics, and long-term care settings reflects the need for health care providers to be competent with computer skills and the management of technological equipment necessary to perform routine safe patient care.

Use of iPads/lap top computers in the classroom settings will include applications that incorporate practice documentation skills and access to lab values, drug information and scientific principles related to client care, supplemental instruction, preparation for licensure examinations and post-graduate skills necessary for effective communication in the health care setting. These tools will become imperative in the development of learning activities that will increase decision making abilities based on science, technology and mathematical information. This "at the patient side" technology is integrated throughout current practice in the health care settings and supports the need for educational opportunities to incorporate high-end technology skills as a routine aspect of iPads will be used in a Learning Community for nursing/natural science classes on a limited basis starting fall 2012. These opportunities need to be available, however, to ALL students involved in the health care professions. (PTA, Pharmacy Technician, MLT, Practical Nursing, Medical Assistant, etc. Recent additions of computer skill classes necessary in Health Information Technology departments has been identified by NIACC faculty with the addition of two classes specifically addressing necessary skill sets specific to health care settings. In addition, integration of computer testing throughout the educational process is imperative for preparing students for computerized licensure and certification exams.

Simulation is an expected teaching modality as evidenced in accreditation and program approval requirements. Simulated experiences offered in our NIACC college lab settings provide the student with the competence and confidence necessary for enhanced clinical performance. High-level human-like mannequins offer learning opportunities replicating actual patient scenarios in a safe, non-threatening learning environment.. This controlled learning opportunity provides greater ability to enhance core knowledge necessary for clinical decision making and successful completion of certification and licensure exams. Instructors, however, need on-going education to facilitate high-level simulation

activities.

Emergency Medical Services and Long-Term Care areas of the Continuing Education Division have also addressed the need for greater use of simulation. EMS incorporates simulation for continuing education for health care providers involved with caring for individuals across the life-span. Expanded learning centers and simulation models to maintain performance of basic and advanced skills in the community continues to be a goal of the Health Education continuing education division. Discussions with one long term care facility have indicated a desire to bring employees to the campus to participate in simulation activities specific to care of the elderly.

Nursing education has specifically targeted a project referred to as QSEN (Quality and Safety Education for Nurses : pre-licensure concepts) to address competencies that will specifically enhance and improve the quality and safety of the healthcare systems. Using the Institute of Medicine competencies, QSEN faculty and a national advisory board identified safety competencies for nursing with identified knowledge, skilss and attitudes for each competencies. Two specific concepts, Evidence based practice and Informatics, reflect the integration of scientific methods/concepts and technology as an integral part of health care practice. Evidence based practice further demonstrates the inclusion of math skills used in research and analysis of data to assist in identification of best practices for improved patient outcomes.

North Iowa Area Community College has a health division faculty that is highly committed to providing learning activities that directly reflect current practice. The Health Division has excellent outcomes on licensure and certification exams for all health programs and is actively seeking expanded opportunities that will provide the student with the knowledge and skills demanded in a health care delivery system that is technology oriented and built on scientific and mathematical principles reflected in evidence-based practice. NIACC's Associate Degree Nursing program remains one of two community college programs in the state with National League for Nursing Accrediting Commission approval and has demonstrated continued success on NCLEX-RN, as evidenced in a ten-year average high for all registered nursing programs in the state of Iowa. The PN, PTA and MA programs continue to report licensure/certification outcomes above the national average. The College is also fortunate to have MMC-NI as a clinical education partner, in addition to the availability of multiple clinical sites in the direct area.

Subject Matter Expertise:
NIACC faculty are actively involved as members within professional organizations and serve on several boards and committees at both the state and national levels. Listed below, are a sampling of affiliations and/or memberships to the aforementioned professional organizations:

NIACC Faculty – Professional Affiliations and Memberships
American Association for the Advancement of Science (AAAS)
American Association of Physics Teachers (AAPT)
American Chemical Society (CS)
American Mathematical Association of Two-Year Colleges (AMATYC)
American Nurses Association
American Society for Engineering Education (ASEE)
Association of Applied Biologists (AAB)
Association of Mathematics Teacher Education (AMTE)
CISCO Academy
CSSIA Member

CompTIA Academy
CyberWatch
Center for Excellence in Science, Mathematics, and Engineering Education (CESMEE)
College Art Association (CAA)
Commission on Accreditation of Allied Health Education Programs (Medical Assisting)
Commission on Accreditation in Physical Therapy Education
Computing in Science and Engineering (CSE)
Ecology Society of America (ESA)
Human Anatomy and Physiology Society (HAPS)
Iowa Academy of Science (IAS)
Iowa Association of Science (IAS)
Iowa Association of Community College Biology Teachers (IACCBT)
Iowa Conservation Education Coalition (ICEC)
Iowa Core Curriculum (state mathematics leadership team: curriculum development)
Iowa Council of Teachers of Mathematics (ICTM)
Iowa Department of Education
Iowa Mathematical Association of Two-Year Colleges (IMATYC)
Iowa Math and Science Education Partnership (IMSEP)
Iowa Prairie Network (IPN)
Michigan Silversmiths Guild (MSG)
Microsoft Academy
National Association for Interpretation (NAI)
National Association of Biology Teachers (NABT)
National Association of Manufacturers (NAM)
National College Teachers of English (NCTE)
National League for Nursing
National League for Nursing Accrediting Commission
National Organization for Associate Degree Nursing
National Science Teachers Association
North American Association of Environmental Educators
Physics Education Research (PER)
Society of North American Goldsmiths (SNAG)
Two-Year College Association (TYCA)
University and College Designer Association (UCDA)

NIACC is currently in beginning discussions regarding possible agreement attainment with the Frank Lloyd Wright School of Architecture as well as Steinway & Sons.

Currently, NIACC is in discussion with the Charles City Community School District (CCCSD) in establishing a STEM academy at their local high school in conjunction with the NIACC Center in Charles City, Iowa. This would include staffing of key NIACC faculty to work in concert with CCCSD faculty as well broadening the vision to include other public school districts within the Charles City area. In time, NIACC is envisioning the possible inclusion of two additional STEM academies to be possibly (currently in discussion) located in the Hampton-Dumont and Forest City areas.

In addition to the multifarious professional organizational affiliations and membership, NIACC's faculty provide rigorous and distinguished instruction in a wide range of courses within the STEAM field of instruction. They are:

NIACC Courses Offerings – STEAM

Science
Anatomy and Physiology I and II
Biology I and II
Career Physics
Classical Physics I and II
College Chemistry I and II
College Physics I and II
General Chemistry I and II
Environmental Science
Field Studies in Biology
Health and Nutrition
Introduction to Bio-Technology
Introduction to General Chemistry
Introduction to Organic and Biochemistry
Introductory Biology
Inquiry into life Science
Microbiology
Nutrition
Organic Chemistry I and II
Physical Science
Survey of Physics

Technology
CISCO Network Security
CISCO Networking
CISCO Routers
Computer Forensics I
Computer Forensics II
Computer User Support
Ethics and the Information Age
Hardening the Infrastructure
Information Assurances/Security Capstone
Information Data Assurance
IT Essentials I
IT Essentials II
IT Specialist Capstone
Network LANS and WANS
Operating Systems II
Virtualization/Cloud Operations
Windows Network Management
Windows Network Management
Windows Server

Windows Workstation Operating Systems

Engineering
Engineering Graphics and Design
Engineering Orientation
Engineering Problems/FORTRAN
Mechanics of Materials
Project-Lead-The-Way – Civil Engineering and Architecture
Project-Lead-The-Way – Computer Integrated Manufacturing
Project-Lead-The-Way – Digital Electronics
Project-Lead-The-Way – Engineering Design and Development
Project-Lead-The-Way – Introduction to Engineering Design
Project-Lead-The-Way – Principles of Engineering
Statics for Engineering

Art
Art Appreciation
Art for Elementary Education
Art History I and II
Ceramics
Creative Photography I and II
Digital Publication Design
Drawing I and II
Graphic Design I and II
Painting I and II
Three-Dimensional Design
Two-Dimensional Design

Math
Applied Math I and II
Business and Financial Math
Business Statistics
Calculus (Business)
Calculus I and II
College Algebra
Combined Algebra
Differential Equations with Laplace Transforms
Elementary Algebra
Enrich Math I and II
Finite Math
Intermediate Algebra
Introduction to Statistics
Mastery Math I and II
Math for Elementary Teachers I and II
Math for Liberal Arts
Prealgebra
Precalculus

Survey of Mathematics
Trigonometry and Analytic Geometry

Additional Considerations:
The College maintains strong and productive relationships with Mason City's CBS affiliate, KIMT, the Mason City Globe Gazette Newspaper, and local radio stations. Communications and public relations are a specialty of the College.

NIACC maintains a powerfully strong relationship with ISU Extension as well. Extension is very involved with our Agriculture-related programming, community and continuing education, and research efforts in technology and the sciences.

Logos – NIACC newspaper; winner of the 2012 Iowa College Media Association's Best Editorial Leadership (Logos staff) in Des Moines.

NIACC Art Instructors recognized for Best in Jewelry (Melissa Lovingood) and Best in Clay (Bill Mateer) at the statewide Iowa Crafts Exhibition competition in Mason City.

NIACC Marketing Department – winner of the 2012 Gold Paragon award from The National Council for Marketing and Public Relations in San Francisco.

NIACC is currently engaging in beginning discussions regarding possible agreement attainment/articulation with the Frank Lloyd Wright School of Architecture in Spring Green, Wisconsin, as we hope to further build on Wright's rich tradition in the architecture of Mason City and the surrounding area.